COURSE DESCRIPTION CARD – SYLLABUS

Course name
Information Technologies for Electrical Power Engineering

Course

Field of study
Electrical engineering

Year/Semester
3/5

Area of study (specialization)
common course

Profile of study
practical

Level of study
first-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:
dr inż. Andrzej Kwapisz

Wydział Inżynierii Środowiska i Energetyki

email:andrzej.kwapisz@put.poznan.pl

tel. 616652282

Responsible for the course/lecturer:
dr inż. Bartosz Olejnik

Wydział Inżynierii Środowiska i Energetyki

email:bartosz.olejnik@put.poznan.pl

tel. 616652581

Prerequisites

Knowledge of mathematical analysis, circuit theory, basic signal processing and programming.

Can achieve the calculation due to the theory of circuits and verify their results, can operate computer software and network communication tools,

Is able to work in group.

Course objective

Knowledge of modern information technology used in the power industry. The use of numerical methods for the calculation of steady-state and transient in power and electrical systems. To familiarize students with the methods of data collection, transmission and storage of data relative to the grid and control systems, transmission systems and distribution of electricity. Get to know the laws and regulations concerning to the patents, intellectual property and personal data protection.

Course-related learning outcomes

Knowledge

1. Has knowledge in modeling power and electrical systems.

2. Has knowledge on the implementation of power and energy measurements in electrical systems using digital technology.

3. Has knowledge of the phenomena occurring in electrical systems.

Skills

1. Is able to create models of basic power system circuits and devices as well as calculation algorithms for these models.

2. Is able to develop project documentation and present clearly both the measurement methods, their results and conclusions.

3. Is able to perform a critical analysis of the operation of simple electrical devices.

Social competences

1. Development of skills for self-study, group work and obtaining new knowledge.

2. Understanding the impact of IT technology on engineer work, the safety of the power system and the environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

Assessment of activity in class, assessment of homework, final test in writing at the end of the semester, colloquium includes test questions or problem tasks, written exam covering the subject of the subject assessed on a scale of 0 to 100%, the final grade lectures given by more than one lecturer based on weighted average, final grade for more than one component grade based on weighted average.

Laboratory

Verification of individual preparation for classes, including material from a single exercise or block of exercises, assessment of individual exercise reports made by the student, colloquium at the end of the semester, colloquium includes test questions or problem tasks, all grades on a scale of 0 to 100%, final grade based on the weighted average of all component ratings.

Programme content

Lecture

Control and supervision systems as a tool for monitoring the operation of the power system. Application of microprocessor technology, recording of events and disturbances, and processing of recorded measurement signals in power protection systems. Selected issues in the field of data transmission. Modeling of power system systems and components. Security in IT systems. Rules for preparing presentation of the results of engineering calculations in electronic and printed versions. Selected issues in the field of copyright (patents, database protection, software licensing methods). Support for teaching through extensive use of publicly available programs (open licenses). Presentation of available alternative sources that allow students to independently expand their knowledge and skills.

Laboratory

Control and supervision systems, application of microprocessor technology, use of CAS software, modeling of selected power systems, verification of data from simulations, data transmission devices.

Teaching methods

Lecture

Multimedia and interactive presentation presenting important issues related to the subject, didactic discussion based on the literature on the subject, informative lecture, problem lecture, case study, work on source materials.

Laboratory

Implementation of exercises, use of publicly available information and software tools to support the didactic process, encouraging students to independently search for optimal solutions and problem solving.

Bibliography

Basic

1. Kacejko P., Inżynieria elektryczna i informatyczna w nowych technologiach elektroenergetycznych, 2010

2. Brozi A., Scilab w przykładach, NAKOM, 2007

3. Czemplik A., Scilab i Matlab - podstawowe zastosowania inżynierskie, Oficyna wydawnicza PWr, 2012

4. Gierycz P., SCILAB w obliczeniach inżynierskich, Oficyna wydawnicza PW, 2015

5. Krzyżanowski P., Obliczenia inżynierskie i naukowe, PWN, 2011

6. Kwapisz A. , Lorenc J., Staszak B., Intermittent Ground-Fault Modeling With EMTP/ATP, Visnik Uniwersytetu Politechnika Lwowska, 2007

Additional

1. H. K. Høidalen, L. Prikler, ATPDRAW version 5.6 Users' Manual, 2009

2. USER'S GUIDE on the use of PSCAD, Manitoba Hydro International Ltd. , 2018

Breakdown of average student's workload

	Hours	ECTS
Total workload	102	4
Classes requiring direct contact with the teacher	53	2
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for tests, colloquiums, pass/exam)	49	2